BOSTON MECHANIC,

AND

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INSTRUCTION OF APPRENTICES.

[Original.]

With the hopes of the friends of the ten hour system, (who, we believe, continue to increase,) that it will induce the classes whom it is intended to benefit, to devote a better portion of their time to their own moral and intellectual improvement than they would or could do, under the old system, are mingled fears that they will fail to make this useful appropriation of the advantages thus granted them; and with respect to a certain class of them, they dare not even cherish these hopes.

But whether the ten hour system or some other is to prevail, there is one thing more which we earnestly desire might prevail, tending directly to the promotion of the same great object—the intellectual elevation of those classes who, according to the common opinion, depend upon their hands —not their heads—for their living;—we mean the instruction of Apprentices.

We would not be understood to say, that there is *no* provision made for the intellectual and moral education of apprentices—as a substitute for the school-instruction which others are enjoying at the same period of life, but we mean to say that these means are both partial and incomplete. We do not deny the great advantages of apprentices' library associations; but these do not include or benefit *all* of this class—by a great deal. We acknowledge that there are lectures and lyceums, which some of them may and do attend, and receive benefit; and we would presume that there are

some—we hope many—masters, who instruct their apprentices in things which they ought to learn; but we are quite sure that these benefits are comparatively limited. Finally, we do not know, that for either mechanic or mercantile apprentices, there is any regular provision for instruction in useful knowledge—or that they are any how regularly taught all they should be; or that whether these things be so or not, more than very few ever obtain such advantages.

Now were it proved to us, that apprentices could and did obtain all the school-instruction necessary to fit them for the station in life in which they are preparing themselves to act, we would not insist upon this point. But we do not believe that in most cases, they either can or do; and while this is so, we would not cease to demand that they *should have* regular means of instruction during their apprenticeship.

In some other places—not in a land of liberty, like ours, where the welfare of all classes ought to be best understood and provided for—not only has this education been deemed important, but actually established, as the following extract from the last number of the Annals of Education will show:

A writer in that work, after speaking of elementary schools established in Lombardy, says, 'beside these, the formation of schools for Sundays, or rather for holidays, including both Sundays and holidays, (which in Catholic countries are numerous,) was provided for. Boys above twelve years of age, who have left the elementary schools, and become apprentices or journeymen, receive instruction for two or three hours every holiday; and thus not only retain what they have before learned, but make still farther advancement. They are even taught drawing, as applied to the mechanical arts, the principles of architecture, &c. * * The holiday schools are also frequented by grown up artisans, who have not had the advantages of elementary education in their youth.'

Again:—'A gentleman has established at Sienna a school for *young artisans*, for one hour *every* day, where they are taught reading, writing and arithmetic.'

Now if such things as these are done in Catholic countries, under the powerful influence of a religion which we are accustomed to believe altogether unfavorable to liberal institutions, will it not be deemed, in this Protestant and republican country, worth the while at least, to weigh the claims of the apprentice to receive farther intellectual as well as mechanical instruction?

Has it not been satisfactorily shown that the people—the working people—do not know half as much as they ought—

either in science or in regard to their own civil and politic a duties? But if this be so, shall not a remedy be proposed? And if the young, who learn mechanical trades, among the rest, do not obtain a sufficient or proper education at the schools, before they leave them, when and where *shall* they obtain it?

We would not hear it said—'There is time enough for study, after they have learned their trades—we want them to work now:' we would ask,—Is not some study necessary to the acquirement and pursuit of their trade? Will they not study to more advantage now, before they have lost the habits of study and the relish for it, acquired at schools, or have acquired other habits unfavorable to it? May they not now obtain better advantages for study, than they will be able to at any future time?

Let masters devote an hour to their instruction in useful branches of knowledge,—let them attend lectures adapted to prepare them for entering the great field of the world into which they are about to enter and labor,—let them have—at some rate or other—schools, which they may profitably attend; in short, we care not what the means shall be—only that they be in the best manner appropriate to the object,—nor by whom provided—only let them *be* provided, and made use of. They are NEEDED.

ADDRESS TO MECHANICS.

THE New York Mechanics' Magazine for October, publishes an address delivered before the mechanics of Easton, Pa., on the fourth of July last, from which we make with pleasure a few short extracts, on subjects deserving general attention.

'THERE is a very common error existing among those who have never reflected on the subject, that those improvements in the Mechanic Arts which have so increased and economized the products of labor, are prejudicial to individuals, by depriving them of work. All experience has shown that it is not the result. The reduction of price always increases the quantity sold in a corresponding degree, and thus the amount of labor which must be done by hand, is kept up, so as to give equal, if not increased employment to operatives. To give a familiar illustration:—Some years since, all the floor boards used in our cities, were planed, tongued and

grooved by hand; now they are principally, if not altogether, done by machinery. Sashes, too, in all our large cities, until lately, were made entirely by hand; now they are made in many places by machinery. In both these items, the prices of the article have been reduced fifty to seventy-five per cent. Many carpenters were apprehensive that these things would ruin their business, and throw them out of employment. Has such been the result? On the contrary, has there not been an increased demand for carpenters in those very cities, from the fact that the diminished expense of building, in consequence of these and other improvements by labor-saving machinery, has induced so many more persons to invest money in buildings? and has not the price of labor among carpenters been so enhanced, that many have gone from the country to the cities, induced by this advance in wages?'

It is added:—'All these things had the effect of changing the direction of labor, and yet no one will doubt but that they have all tended to advance the interests of the community at large; and it may be laid down as an axiom in political economy, that, whatever benefits the community at large, must eventually benefit all the members of that community.'

In illustration of the *science* of the mechanic employments, it is remarked:

'The carpenter or mason who lays out his building by the use of the base 6, the perpendicular 8, and the hypothenuse 10, or corresponding numbers, has the demonstration that he is laying out the building at right angles, in the 47th proposition of the first book of Euclid's elements;—the sum of the squares of the base and perpendicular being equal to the square of the hypothenuse.' * * 'The tanner, in preparing his leather, is a chemist in practice—so, too, the saddler and shoemaker, even in the preparation of their wax ends, in giving proper consistency and tenacity to the materials used, independent of the philosophical principles in the shapes and forms of their work, and its adaptation to its intended purposes.'

The following are among the closing remarks:—'The great object which I have had, in throwing together these desultory observations, has been to call your attention to the propriety, nay, necessity of improving yourselves in your various callings and trades, by learning, in addition to the practice, the principles on which your work is done;—in other words, to ask you to think, to reflect, to read, and learn what others have done before you, and to add your own experience to the existing stock of knowledge.'

And, after advising the formation of a Mechanics' Institute, and procuring a library and making provision for appropriate lectures, he observes:

'The result will be that *reflection* will be induced. Your apprentices will be taught to *read* and *think*; and reading and thinking apprentices make intelligent journeymen, who in turn will make intelligent master workmen, fit to fill any station to which they may be called.'

CEMENT FOR ROADS.

THE following account, being the substance of the specification of an English patent, granted to John Henry Cassel, is deserving of attention. The subject of road-making is one which is by no means so well attended to in this country as it should be. We would observe that a patent has been obtained in this country, which has been published in this work, for preparing roads with tar.

'MY invention consists in cementing and combining the materials for road making, and for constructing docks, watercourses, foundations, and such like works, by the aid of coal or other mineral tar, wood tar, and resinous matters, or the products of tar, in the manner hereafter described, and thus producing a concrete mass, which may be formed or moulded into the desired figure, which, when cold, will be exceedingly hard, and be suitable for the purposes of cement, stone or brick, in constructing such works. I take a quantity of tar, such as is produced by the distillation of coal, shale or wood, and by further distillation, I separate the aqueous part therefrom, and thus reduce the tar or resinous substance to the consistency of treacle; and this I call the first product, the tar or resinous substance being in a thick and adhesive condition when cold. In order to produce the second product, I carry on the distillation still further, and by this means I obtain the essential oil; and for the third product, I carry on the process of distillation till the substance becomes so adhesive, that a small portion being removed from the still, will draw out into threads, and when cold, becomes brittle; this will soon be judged of by practice; and for the fourth product, carry on the distillation still further, till the substance becomes extremely hard, and which will not soften by the heat of the sun. The apparatus or still, which I use for this purpose, is similar to what is called a pitch still, which is

well known, and forms no part of my invention, nor does the process of distillation for separating the tar into three products, that is to say:—First, tar deprived of the aqueous parts, and reduced to a thick and adhesive condition when cold. Secondly, the essential oil. Thirdly, the adhesive tar, (or product thereof,) which when cold, is hard; and fourthly, the substance not acted on by the heat of the sun.'

'The application of these products to road making, is thus described:—'Having laid out the road, and made the necessary drains for preventing the lodgment of water below the road, I prepare the surface by beating or rolling, in order to compress the earth, particularly when such surface is composed of loose earth, and by raking, bring the surface to the figure desired, that is, with such slopes as I have determined on, and make the same as even as possible. I then saturate such surface with the essential oil, (the second product,) in thin layers, allowing time to subside. The oil thus laid on will quickly penetrate the earth. I then proceed with the second operation, which consists of laying over the surface of the earth so prepared, a thin coating of the first product, say one fourth of an inch thick, and set fire to the same, and permit it to burn a few seconds. Dry sand, or fine dry earth, or slag, or cinder, or a combination of these, are to be sifted on the tar and oil, to the depth of about half an inch, which will put out the flame. I then beat or roll the same, in order to blend or cement them together; and in order to facilitate the operation, I find it desirable to have a frame of iron or other material, about three feet square, which I successively place over the surface of the road, and thus complete portions of the surface at each operation. By this means, it will be evident that I produce a thin cemented layer or surface, on the road. In some instances I make one, two or more layers of this description, on the road, depending on the extent of traffic to which it is to be subjected; but it will be desirable to remark, that I only use the essential oil previous to the first layer. Having thus prepared the under surface of the road, I proceed to finish the same; and the finishing materially depends on the description of materials which may readily be obtained where the road is making, broken granite, or flint, or slag, or gravel, or hard material suitable for the surface of a road; and I mean, in the present instance, that the same should be broken somewhat small, say not larger than three inches; and I take, by weight, one of the third product to two of sand, and boil and mix them well together; I lay over such broken materials to the desired

depth, and then pour in such sand and third product, which, running into the space between the stones, forms a solid mass when cold. When the said fourth product is in a melted state, I mix, in an open vessel, any of the materials, sand, stone, &c., in the proportion of one of the fourth product to three of the stone, sand, &c., by weight, and combine them well together, and when so combined, I lay them over the surface of the road, from one to four inches, or more if desired, the road being prepared as before described; this is to be beaten down, and as even a surface as possible produced, by which means a hard surface will be formed, and will wear exceedingly well, and produce a cheap and lasting road. Or, where it is desired that the upper surface should be formed of larger stones or other material, such as broken granite, flints, slag, or other substances, of a size such as is used in making what are called McAdamized roads, or larger, I have frames or moulds, from twelve to forty-eight inches square, open at top and bottom like a brick mould, and I pack in a number of such broken pieces of material, and then run in a quantity of the fourth product in a melted state, and thus fill up the interstices between the stones or other materials; and making the upper surfaces as even as possible, these materials are left in the moulds till they are cold; they will then be strongly cemented together, and be ready to form the upper surface or road, and they are to be put on in the following manner:—Having prepared the road as above described, by the essential oil, and the first product, and the sand or fine earth, or other material, I lay over a coat, say one inch of the third product of the tar, then cover the surface, while the third product is hot, with the moulded materials, placing that part which was uppermost in the act of moulding on the surface of the road prepared as above, and by beating or pressing, cause the moulded parts to adhere firmly; by this means, a rather rough surface for the tread of a horse will be produced to the road. I also use the first preparation to cover good McAdamized or other roads, which firmly cements every stone into its place, prevents the wheels from ploughing the roads, the water from softening the substrata, and preventing mud and dust from rising.'

From this, we imagine, will easily be understood the means and methods of applying the same to the fitting up of docks, cisterns, &c., which we forbear giving in full.

METALLIC ALLOYS.

The following are some of the most important alloys of metals, with the proportions of each ingredient. For them we are indebted, through the Journal of the Franklin Institute, to the labors of an experienced French chemist.

United States standard gold :—Gold, 899·22 ; Copper and Silver, 100·78.

United States standard silver :—Silver, 892·43 ; Copper, 107·57.

Alloy for Bells :—Copper, $\frac{3}{4}$; Tin, $\frac{1}{4}$.

An alloy fusible in boiling water :—Bismuth, 8 ; Lead, 5 ; Tin, 3.

Alloy for Types :—Lead, $\frac{4}{5}$; Antimony, $\frac{1}{5}$. Sometimes a small quantity of copper is added to these.

Alloy of Jewelry, French standard :—Gold, $\frac{3}{4}$; Copper, $\frac{1}{4}$.

Alloy for Silver Plate, French standard :—Silver, 95 ; Copper, 5.

Brass for the lathe :—Copper, 65·80 ; Zinc, 31·80 ; Lead, 2·15 ; Tin, ·25. The presence of the latter metal in the specimens examined, is supposed to be accidental.

Brass for hammering—an important alloy :—Copper, 70·10 ; Zinc, 29·90.

Amalgam for silvering mirrors :—Tin, 70 ; Mercury, 30.

Alloy for Cannon :—Copper, 100 ; Tin, 11.

Amalgam for the cushions of electrical machines :—Mercury, $\frac{1}{2}$; Tin and Zinc, $\frac{1}{4}$ each.

INCONVENIENCES OF IGNORANCE.

The following just remarks are made by the Editors of the Mechanics' Assistant, in an article on elementary knowledge. How much of this species of knowledge is wanted, something of a judgment may be formed from the extract itself, which presents, we believe, a pretty fair view of what is too generally the state of things.

We have frequently been applied to by mechanics, to explain books which to them were unintelligible, for want of elementary knowledge. The best books on Architecture, Mechanics and Engineering, frame their proportions by Algebraical characters, which are unintelligible to those who

have not the elements of this science; and these elements may be taught in a few lessons, and learned with little application. How many mechanics would become mathematicians, did they but possess the elements of that science; and what time and labor would they save, had they but a small knowledge on this subject. We have known them spend several days, and cover several sheets of paper with figures, to arrive at a result by approximation, which they could have obtained direct, had they known the method, with a few minutes' labor. We have known coasting captains from the East, who have been driven off their direct course, come back again on the line they were driven off, in order to make their course as it was before, because they were ignorant of the mere elements of navigation, which would have enabled them to shape a course and distance from any point.

How many petty miseries, arising from what are called accidents or misfortunes, would be avoided, if but the elements of natural philosophy were known; and the pain and inconvenience of learning by experience, so well known by mechanics, especially if they have families, be lessened! The simple facts that heat expands bodies; that rarefied air is lighter than common air, and will ascend; that the atmosphere has weight and pressure, and that chemical affinity frequently destroys the qualities of simples in their compounds;—the knowledge of these only would have saved much property, and avoided pain and inconvenience, arising from what have too frequently been called accidents, but which have been the genuine effects of nature.

RESPECTABILITY OF MECHANICS.

THE following sentiments, from a high literary source, are deserving a place in the Boston Mechanic. They are said to be from a new work of the Misses Sedgwick, dedicated to 'farmers and mechanics;' but which we have not seen.

IT is certainly a false notion in a democratic republic, that a lawyer has any higher claim to respectability—gentility, if you please—than a tanner, a goldsmith, a painter, or a builder. It is the fault of the mechanic, if he takes the place not assigned to him by the government and institutions of his country. He is of the lower orders, only when he is self-

degraded by the ignorance and coarse manners which are associated with manual labor, in countries where society is divided into castes, and have therefore come to be considered inseparable from it. Rely upon it, it is not so. The old barriers are down. The time has come when, 'being mechanics,' we may appear on 'laboring days' as well as holidays, without the 'sign of our profession.' Talent and worth are the only eternal grounds of distinction. To these the Almighty has affixed his everlasting patent of nobility, and these it is which make bright 'the immortal names' to which our children may aspire as well as others. But we must secure, by our own efforts, the elevations that are now accessible to all.

AMERICAN PATENTS.

[Abridged from the Journal of the Franklin Institute.]

PATENT *for an improvement in the Flat or Sad Iron;* William Wilson, Greenfield, Franklin county, Massachusetts, March 27.

Instead of using a wrought iron handle laid in the flask, and embraced by the cast iron, a dovetail groove or mortise is cast on the upper part of the iron, and a cast iron handle, with a part corresponding to the dovetail groove, is made to slide into it.

'What is claimed as a patent, is the manner of affixing the handle to the flat or sad iron, by means of the tenon and mortise, in form of a dovetail, in manner before described; and the making of the handle of cast iron separate from the sad iron, and having the tenon joined to it as aforesaid, and cast at the same time with the handle.'

PATENT *for an improvement in the Mode of Sustaining the Weight, and Applying the Power in Wheel Carriages;* Samuel Chapman, Jr., Windsor, Berkshire county, Massachusetts, March 2.

A more singular method of applying wheels to carriages, than this perhaps, never was invented. The principle is applied to both common road and railroad carriages. The axles and wheels, revolving on the road, are, themselves, wholly unconnected with the carriage; but a pair of what the patentee calls friction or driving wheels, being affixed to the carriage, rest upon the top of each wheel, and thereby support the carriage upon it—the main wheel resting between them. On common road

carriages, the axles on which the running wheels are placed must have another, and a smaller pair of wheels; and on these smaller ones the friction wheels rest, supporting the carriage. These wheels, it appears, are to be furnished with grooves or flanches, to keep them on the running wheels, in the same way as the wheels of the cars are kept upon the railroads. What we are most at a loss about is, what good purpose the patentee expected these extra wheels would answer. From his using the term friction wheels, however, we are induced to presume that he expected a sufficient reduction of friction, at least, to pay for the expense of some *dozen* of extra wheels, viz., *three* to each single running wheel of a common road four-wheel carriage.

PATENT *for an improved mode of making or preparing the Pannels for Coaches, and other Wheeled Carriages;* Ebenezer A. Lester, Machinist, Boston, Massachusetts, March 18.

The improvement consists in making the pannels of metal, instead of wood; and for this purpose I prefer to use sheet iron, as combining lightness and strength, while it is less costly than most of the other metals. Sheets of zinc, copper or other metal, or metallic alloy, may also be used. The frame for the insertion of the pannel may be grooved in the usual manner, and the pannel, properly raised and formed, inserted in these grooves when the frame is put together; the pannels are then to be painted and finished. I intend sometimes to finish such pannels by japanning them, as tea trays and other articles are japanned; and in this case it will be best, instead of grooving the frames, to form rebates therein, so that when the body of the carriage or other vehicle, has been completely painted and varnished, the pannels can be put into the frames from within, and secured there by means of strips of wood or metal, or in any other manner which may be found convenient.

RAILROAD TURNOUTS, WITH FLEXIBLE RAILS.

[By THOMAS GORTON, from the Amer. Jour. of Arts and Sciences.]

UP to the present time, all turnouts upon railroads, (so far as the writer's knowledge extends,) have been constructed with stiff movable rails. When these stiff rails are moved round so as to make a communication with the turnout and main line, a rectilinear angle of several degrees is formed by the stiff rail and main line, which subjects cars passing

through the turnout to much jar and lateral friction. This friction is so great as to injure both cars and railroad. In a late conversation with Mr. E. Miller, superintendent of machinery on the Portage railroad, he informed me that they proposed using *flexible* movable rails for their turnouts. The rail adopted on that road is the parallel edge rail, eighteen feet long, and weighing forty pounds per yard. I understood that the plan of their turnouts was not fully matured, but that it was contemplated to have about three feet of the rail made fast in two heavy chairs, and the other fifteen feet to be sprung into a curved form, when it was desired to pass into the crossing or turnout.

This at once appeared to me to be a decided improvement, inasmuch as turnouts might be made on this principle, so that cars might pass through them with the same facility as in the curved parts of the main line. In examining the subject, the first requisite is, that the rail at the movable end should be deflected so as to leave a sufficient distance between the rail of the main line and the fixed part of the turnout. Then, secondly, let the radius of curvature for the turnout be determined. It will be seen that these two requisites determine the length of the movable rails. These rails may then be laid down in the following manner:

Let about one foot of that part connected with the main line be made fast in a heavy cast iron chair, by a wedge, and by a bolt passing through the chair and rail. The movable part of the rail may be supported on chairs; these chairs to rest on cast iron seats, having a ledge on one side for the chairs to slide against when the rail is sprung round into the turnout. The seats consequently must be laid down in the curve form which the rail is to assume in the turnout. If it is thought that the chairs on this part of the rail will work out of place, they may be bolted to it, or secured in some other manner by guides on the seats. The two movable rails of a turnout should then be connected by two or three stiff coupling bars, to give them permanence, and preserve the proper distance between them. The rails may then be worked by a vertical lever of a suitable length. This lever, with a ball placed upon its top, will serve as an index to persons travelling the road, by pointing out the position of the movable rails, that the cars may be stopped in time, if the rails are not right.

It is believed that a turnout of from 400 to 500 feet radius with flexible rails, will be found to answer a much better

purpose than those in use at the present time. Several important railroads have curves as abrupt as this. On the Baltimore and Ohio railroad there are two sharp curves, one of 337, and the other of only 318 feet radius.

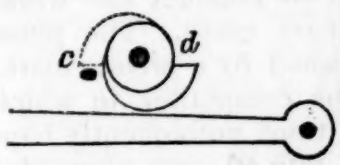
A LATCH-LOCK.

[Furnished for the Boston Mechanic.]

MESSRS. EDITORS:—To kill two birds with one stone, by some, is reckoned an important art of economy. The following, I trust, will be thought no unworthy example of it.

If a latch were a lock, thought I, what were the need of any other lock; and a feasible plan for making one of it soon suggested itself, which I will detail somewhat at length for the good of your readers, should you see fit to publish it.

Just above the latch, let there be fixed a thin piece of metal, revolving on a pin in the centre, made narrow on one side, but growing gradually broader, in a spiral form, on the other, as represented in the drawing annexed. At *d*, it suddenly breaks off upon the narrow part. Let this be fixed so near that when the broad part is down, it will prevent the latch from rising; but when turned round, so that the narrow part shall be down, there will be plenty of room for the latch to play. At *c*, let a small pin be fixed: this will prevent the plate from turning from left to right; but when it is turned from right to left, the projection *d* will rest on the pin, as shown by the dotted part of the figure, and thus prevent its being moved any father; and so keep it unlocked. Then let a key be fixed, to turn the plate from without the door, and our lock is finished.



STEAM-ENGINES IN GLASGOW.—To such an extent is the business of steam-engine making now carried on here that there are thirteen firms engaged in it. Some of the works are more like national than private undertakings.

COMPETITION PLANS OF BUILDINGS.

THE following remarks were written for the latitude and longitude of England; but we think they may not be altogether inappropriate to the state of things in this country. If it be the case that all or any of these abuses exist here, it cannot be too soon to seek for their remedy; and if not, the knowledge of their prevalence elsewhere will make those concerned to be more on their guard against the introduction of similar abuses.

EVERY person, whose attention has been in the least degree directed to architecture, must have observed that, at the present day, the practice of procuring plans for buildings, by public competition, is becoming more and more prevalent; though it is more commonly employed in the case of public buildings than in those of a private nature. When a public building is about to be erected, the parties advertise a description of what is wanted, offering generally, a premium for the best plan, or for that which shall be finally adopted. Sometimes the successful competitors have nothing for their reward but that of being employed to conduct the work, for which they are paid as in ordinary cases. The plans submitted are, or should be, distinguished by a private mark, referring to a sealed letter sent by the competitor, in which his real address is to be found: and it not unfrequently happens that there will be from forty to fifty of such plans sent in, varying, of course, in equally numerous degrees of merit. Not a few of these drawings are the result of great labor, seldom occupying the time of the competitor for less than three weeks, and if the building be very extensive, and the design well matured, having employed his sole attention for months together. The unsuccessful competitor consequently sustains a very serious loss; as he is not like the landscape or figure painter, who can carry his drawings to the market; the plans of the architect can be of no use but for the purpose for which they were originally intended. In fact, there cannot be, in any other profession, a competition which requires such a sacrifice on the part of the competitor, as in architecture; and, were this sufficiently impressed on the public mind, there can be no doubt but the labors of the architect would, in all such cases, be more duly appreciated, and at least, rewarded with an impartial distribution of justice.

In most cases where a decision is made on competition plans, the judges consist of men who are but indifferently qualified for the task, and whose fancy is easily carried away

by a gaudy picture, the intrinsic merits of which they are incapable of appreciating; or perhaps, by a design which has nothing else to recommend it but that of being so common-place in its character, as to be more familiar to their ideas than one of higher pretensions. Indeed, it is not to be supposed that men, whose pursuits of life are so totally unconnected with the subject, as never even to have led them to the inspection of a simple plan of a house, should be able to form a correct judgment of a number of elaborate drawings. It may, perhaps, be thought rather an uncharitable conclusion, but, certainly, there is but too much reason to fear that sinister influences have, in many cases, had an undue weight; and it is the particular object of this article to point out these grievances.

The undue means which are sometimes resorted to by competitors to forward their own cause, are disgraceful in the extreme; some have been known openly to carry about their designs, for the purpose of procuring votes, before the general election; some unfairly attach their names to their plans, (instead of using a private mark, as they ought to do,) in the hope that their friends may exert undue influence in their favor, or from a vain confidence in their own importance, which leads them to expect that the name alone will produce a favorable impression; and some have even been known surreptitiously to withdraw their designs from the exhibition, in order to add improvements which have been suggested by the designs of another; nay, such is the total want of principle, and disregard of justice to the competitors, shown in some cases, that an instance could be brought forward where one of the competitors was appointed the judge!

MANUFACTURE OF BRONZE.

[From the London Mec. Magazine.]

During the last thirty years, the manufacture of bronzes has acquired considerable importance in France; and as this branch of industry owes the impulse it has received to the good taste of the French artists, it has had no competition to encounter in foreign markets. The principal seat of the manufacture is at Paris, where as many as 250 houses are exclusively engaged in the manufacture of every description of articles in bronze. The number of workmen is estimated

at 5,000; and if we add to them the gilders, who form a distinct body, the number of persons, masters and workmen, who find in the bronze manufacture a steady and lucrative occupation, will amount to nearly 6,000. The manufacture is estimated to produce annually the sum of about 800,000*l.*, of which, from 400,000*l.* to 500,000*l.* is the value of articles sold in France, and from 280,000*l.* to 320,000*l.*, the price of articles exported to foreign countries. For some time past, the use of bronze in the manufacture of chandeliers and lamps has become very common, and the employment of the article is daily becoming more extensive, both for ornament and use. The division of labor is now established on a large scale in this branch of manufacture; and many founders employ a large number of workmen in making one particular part of an article.

Since the founders have employed, in the manufacture of ornamental bronzes, one third of zinc, the cost of which is less than that of copper, the price of the material, and consequently of the article manufactured from it, has been reduced, and the demand has increased in proportion.

SILK MAKING.

[Original.]

The introduction of the raising of silk, which is now becoming a matter of great and growing interest in our country, we regard as a subject of congratulation to ourselves. Besides the advantages likely to result as a source of national prosperity, in so far as it shall become an object of national enterprize, we believe it will produce a happy effect upon the domestic character, in affording a new branch of lucrative employment to a class of society who are limited by custom to by far too small a field of useful industry—we mean the females. The business of raising the worms, and preparing the silk, is said to be exclusively given to them. We hope that at least in this department, the just produce of female labor will not be deemed a thing to be whittled down at pleasure, as has been the case in other branches of industry, where they have had hard and sad work to earn their living, even if they could get what they earned.

'The silk of America,' says the American Silk Growers' Guide, a manual recently published, 'is found to contain a fibre

stronger and of a quality superior to that of almost any other country. * * Specimens have been examined by the Chamber of Commerce of Lyons (France) at a very late date.' An experienced judge of the article says, 'he has lately woven many pounds of silk, of American growth; and he has seen many samples of American silk far superior to the Bengal, China and French silks, and nearly equal to the best Italian.'

The following estimate, made by Andrew Palmatier of New York, of the expenses and profits of this manufacture, is taken from one of the public prints interested in the subject:

'One acre of ground, fenced by mulberry hedges and set out with trees, ...	$250 00
Interest and additional expense during five years, .	187 50
Total expense, ...	$437 50

The acre will then produce:

From 5 to 10 years, ...	10 per cent.
" 10 to 15 "	47 "
" 15 to 20 "	112 "

which will average nearly 45 per cent. for the first twenty years, and continue at 112 per cent. afterwards.

'According to this calculation, an acre will pay on an average of twenty years, $205 65 a year, and $490 a year afterwards.'

ADVICE TO APPRENTICES.

A good word of advice in season is, in the language of a writer of old, 'like apples of gold.' The following, from the New York Mechanics' Magazine, may serve a good purpose, if read and remembered, as good advice is not apt to be.

There is an old saying, that 'when the boy assumes the man, the man will play the boy.' Another, 'a forward boy makes a froward man.' I quote these old sayings, not to discourage boys from endeavoring to store their minds with as much as they can of the knowledge that appertains to, and can be expected from men only, but to guard them against the too common fault of supposing themselves possessed of that after which they have only commenced the pursuit. An ancient philosopher has said, 'I have lived to threescore years and ten to learn that I know nothing.' What presump-

tion, then, for boys to flatter themselves that they know too much to be taught by men! That some boys have thus deceived themselves to their injury, nay, sometimes to their destruction, my own observation can bear testimony.

'It is much easier to learn than to unlearn bad habits;' this the experience of life teaches. How necessary, then, for every boy, when he first leaves the parental roof, to learn a trade by which he hopes to make a comfortable livelihood, and that he should so form his habits as to insure success; and this can be done only by conducting himself in such a way as to command respect for himself, and by cherishing the noble feeling of adding respectability to his calling.

An important consideration for a boy, when he first enters a shop, next to obtaining the good opinion of his master, is the conciliating that of the journeymen; for he ought to know, that it is not in the power of a master to teach himself, directly, all the minutiæ of his business to every apprentice he may have. The boy must observe for himself; and anything he does not understand, he can learn from journeymen, or older apprentices, by a frank inquiry, if he shows in his conduct that he is deserving of it. Almost every man, whatever his general deportment may be, is gratified to give information to a boy, when it is asked with sincerity, and an evident desire for improvement. When advice is given, although it may appear at the time that not much knowledge has been imparted, receive it kindly and thankfully; in after years you may highly appreciate it.

It has been said, 'There is no royal road to science;' nor can a man be a good mechanic by intuition. The proverb, 'Little strokes fell great oaks,' may be truly applied to the acquisition of mechanical knowledge, which, to be permanently useful, must be attained gradually. This fact ought not to dishearten the young apprentice, for he will soon find that every new acquisition of knowledge in his trade is a new incentive to exertion, and that progressing in knowledge is the most solid happiness of life.

Giving each other nicknames is a vulgar habit to which boys are much addicted. It should be avoided, for it frequently causes wrangling and fighting, and destroys friendships that might otherwise be advantageously cemented through life.

Avoid also the frequent use of by-words; they may be, and many of them are, harmless; but the habit is vulgar, and degrades you in the estimation of the more thinking part of the community. Above all, do not get in the habit of inter-

larding your conversation with oaths; this, to say nothing of the blasphemy, is detestable in every respect; nothing is more grating to the feelings of a man of sense. 'Swear not at all,' is a command in Holy Writ. Read the sacred volumes with attention; maxims are there to be found more profitable in life, if correctly understood and acted up to, than can be found anywhere else.

The following paragraph, though from a different source, should be read, not as an appendix to the above, but as a valuable part of the text.

It should be the constant aim of apprentices, to be the *first* in their business, and not behind others in a proper cultivation of the intellectual faculties. They may do this if they will, and by doing it, they will find mechanics a different set of men in a few years, and occupying quite a different place in society. It is a foolish notion that every man who has a diploma, is a great and learned man—and society by and by will acknowledge it. Apprentices may do much to forward this result. Will they try?

INTELLECT OF PRINTERS.

[From the New York Mirror.]

It is singular how many practical printers are at the head of the newspaper and periodical press at the present time, both in Great Britain and this country; and how many gentlemen of the same profession have been conspicuous in the halls of legislation, and the walks of science and elegant literature. Notwithstanding the sneers of some would-be gentlemen, and their affected deprecation of the very individuals by whom they subsist, we do not know a prouder or more gratifying title than that of a member of the 'Art preservative of all arts,' by which currency and stability are given to the fleeting and otherwise transitory speculations of the philosopher and the moralist; by which the bright conceptions of the poet are embodied in a durable form, and are conveyed wherever a wave dances, a wind blows, or a language is spoken; by which the business of life is realized; which is the source of every refined and elegant pleasure; to which all the modern cultivations and improvements of science owe their origin; to which the liberal arts are

indebted for their expansion and influence, and every member of which is as much superior to the supercilious and sneering sciolist in literature and manners, as the man of sense is to the drivelling idiot, or the polished inhabitants of New York, London and Paris, to the half naked savage of the Feejee Islands. There is scarcely a country newspaper which is not edited and printed by the same individual, and the majority of the journals of the cities are similarly circumstanced. This is a high eulogium on the industry, talents, perseverance and enterprise of these gentlemen, and at once proves the profession to be well entitled to the designation of a liberal art.

PASSAGE OF THE ALLEGHANY.

The following account of the Passage of the Philadelphia and Pittsburg Railroad and Canal through the Alleghany mountains, is given by a gentlemen who passed over them in May last, in a New York paper.

The Railroad, which is 395 miles long, crosses the Schuylkill by a viaduct 1045 feet long, 41 wide, and 30 above water. It then ascends an inclined plane of 2809 feet, by a stationary engine; and descends another of 1720 feet, to Columbia, on the Susquehanna, where it joins the main division of the Pennsylvania Canal, 80 miles from Philadelphia—which canal passes through Harrisburg, and follows the Juniata branch of the Susquehanna. The cost of this railroad was three and a half millions. Its greatest altitude above the waters of the Delaware is 555 feet. The next is the canal, 172 miles long, having 18 dams, 33 aqueducts, and 111 locks, to near the Alleghany mountains, which is ascended by five inclined planes of nearly a mile in length, and descended by five more. It passes a tunnel through solid rock, 870 feet, having an arch of heavy masonry 20 feet high. The length of the road over the Alleghany is 36 miles, overcoming an aggregate height of 2570 feet, and having four extensive viaducts. At Johnstown, on the Konemaugh, it meets the canal, which is 104 miles long, to Pittsburg, and has 64 locks, 10 dams, 2 tunnels, 15 aqueducts, 64 culverts, 152 bridges, and passes through a tunnel perforating a hill 250 feet high. It appears from the account, that the cars are drawn by horses over the Alleghany part of the road, except at the inclined planes.

ON THE PREPARATION OF BISTRE.

This color, used by painters in the manner of Indian ink, is prepared from wood soot, in the following manner:—Make choice of those pieces of soot which are the hardest, and adhere most to the chimney; pulverize them, and pass the powder through a fine sieve. Throw this powder into pure water, stir it from time to time with a glass spatula, leave it at rest, and finally, pour off the water. This water dissolves all the foreign salts. We may hasten their solution by placing the glazed earthen vessel containing the solution over a fire. When other water, on being added, will no longer dissolve any salt, and it remains of the same degree of specific gravity as before it was employed, we put the sediment into a tall narrow vessel, which is to be filled with water, and agitate it with the spatula; it is then left at rest for a few minutes, in order that the coarser parts may settle. The liquid is then to be poured into another similar vessel, and the coarser parts remaining at the bottom of the former one may be thrown away as useless. This operation may be repeated two or three times, and the oftener, the finer will be the bistre. It must be finally left at rest for some time, and the clear water poured off from the sediment, which is to be incorporated with gum water, and it is fit for use.

DIAMOND MILL AT AMSTERDAM.

The diamond mill is one of the most interesting objects in Amsterdam. Four horses turn a wheel, setting in motion a number of smaller wheels in the room above, whose cogs, acting on circular metal plates, keep them in continual revolution. Pulverized diamond is placed on these; and the stone to be polished, fastened at the end of a piece of wood by means of an amalgam of zinc and quicksilver, is submitted to the friction of the adamantine particles. This is the only mode of acting on diamond, which can be ground, and even cut by particles of the same substance. In the latter operation, diamond dust is fixed on a metal wire that is moved rapidly backwards and forwards over the stone to be cut.

NOTES FOR NOVEMBER.

THE BOSTON BOOK.—We can but recommend those who wish to find, in an *annual*, a sound and interesting and valuable collection of matter, to examine the Boston Book; and we need but refer to the fact that it is composed almost exclusively of selections from living authors of this city—whose fame as the literary metropolis of New England, is a part of the fame, and the well-earned fame, of the writers of which it bo. sts. Of both poetry and prose, an abundant variety is afforded, and such as is as well adapted to the humor of all sorts of readers, as can be found in any of the literary compilations extant, from all of which, portions—perhaps the best portions of the quota which Boston writers have furnished towards making up their contents—have been selected. A compilation at the same time so select, so varied in character, and so abundant, to the latter of which attributes the list of contents, and to the rest, the above described circumstances, will sufficiently testify, is one which nobody can hesitate to recommend to all classes of the reading community. Considering what it is, it is quite cheap, and that without impairing it at all in point of neatness or even elegance of execution; and it may well be recommended to those who refrain from indulging in the costlier annuals.

THE LEGAL CLASSIC, OR THE YOUNG AMERICAN'S FIRST BOOK OF RIGHTS AND DUTIES.—We are of the opinion that no one can know too much about his rights and duties, as laid down by the laws of his country. We hold that every one ought to make himself acquainted, as far as he can, both with the laws and the principles on which they are made. Then, when called on to contribute, by his vote, to the making of laws, will he be able much the better to discharge that duty. For these reasons, we recommend the reading of this book to every one who claims, and would fain deserve, the privileges of American citizenship.

THE MECHANIC'S LIBRARY, OR BOOK OF TRADES.—A good work of this kind cannot fail of being a valuable acquisition to the artisan. Though not having been able to examine a copy ourselves, we have good reason to believe that it is a useful compendium of practical information, worthy of the title prefixed to it. At any rate, every workman ought to have such a work.

FLOURISHING BUSINESS.—It is estimated that no less than two million pairs of shoes were made in Lynn last year.

'Honor to whom Honor is Due.'—At the late commencement in Union college, Albany, the honorary degree of A. M. was conferred upon John Patterson, of that city, a journeyman printer, whose mathematical attainments richly entitled him to that distinction. He served his apprenticeship at Buffalo, came to this city some twelve years ago, where he has since worked, and is still working, as a journeyman. He is now one of the best practical printers in the Union. By devoting those hours of relaxation which most of us idle away, to severe study, Mr. Patterson has not only stored his mind with useful general information, but acquired a knowledge of mathematics which has won for him a degree from one of the most reputable colleges in the Union. In addition to all this, with a family to support from his earnings, Mr. Patterson has accumulated about three thousand dollars, the fruits of patient toil and economy.

To cut Glass.—Draw your pattern on paper and place it under the glass, holding both together in your hand, (for the glass must not rest on a plain surface;) then take a spike or similar piece of iron, heat the point of it to redness, and apply it to the edge of the glass—draw the iron slowly forward, and the chink in the glass will follow at the distance of about half an inch. Sometimes it may be necessary, especially in turning corners, to apply a wet finger to the opposite side of the glass. The iron should be re-heated when the crack in the glass ceases to follow.

New Source of Power.—A correspondent of an English scientific journal suggests the idea of employing to some useful purpose, on board ships, the power which might be derived from the motion of the rudder. 'I have frequently,' says he, 'during a calm, observed a ship's rudder rising, as the ship sinks, and falling, with a motion resembling that of the piston of a steam-engine.' It might be employed, we imagine, at least, to work a pump; and were it possible to make it aid in propelling the vessel, during a calm, it would be a still more advantageous source of power.

More Coal.—A Taunton paper informs us that a bed of bituminous coal, more than six feet in depth, had been discovered in that town, about half a mile from the Providence Rail Road. The quality has been proved to be good. So, in all probability, we shall not be obliged to send all the way to Pennsylvania for our winter's fuel, especially since the railroad is so near.

Wheat.—A kind of wheat, it is said, has been introduced into France, which ripens in 70 days—less than three months.

MINIATURE STEAM-ENGINE.—A working model of a high pressure steam-engine, made of silver, which, boiler and all, may be put into a thimble, is said to be in the possession of a Mr. Toplis, of the Museum of national manufactures, Leicester Square, (London.) It weighs only two hundred and fifty grains, yet it is perfect in all parts; and will generate steam enough to keep it a-going five minutes.

SOAP STONE AQUEDUCTS.—In the districts of Vermont where this mineral abounds, it is made use of for aqueducts, and is found to be a cheap and durable material for this purpose. The stone is first sawed into blocks about three inches square, and from one to two or three feet in length; and these are bored longitudinally with an auger. The pipes thus constructed are joined by lead tubes adapted to the bore, and an inch and a half or two inches in length.

SUBSTITUTES FOR LINEN.—The editor of the Journal of Arts and Sciences remarks of the preparation of the bark of common milkweed, as a substitute for linen, which has been patented—'The articles manufactured from it are very beautiful. We are fully satisfied that it is capable of being wrought into many forms both of beauty and utility.' The patentee is a Miss Gerrish, of Salem. The milkweed is a notorious weed, and a very hardy one.

A correspondent of the above journal shows that the bark of a cultivated species of hibiscus, which he names rose of sharon, is applicable to similar purposes to which other fibrous barks are applied. 'The plant,' he says, 'is robust, and easily cultivated, and being perennial, might be raised in a long succession of crops on the same ground, with facility; with less labor and a greater product than either flax or hemp.'

MARCH OF STEAM.—An English clergyman of Cheshire, say the papers, has invented a steam-engine, the cost of erecting which will be only a tenth of that of a common steam-engine, and the expense of working it only a thousandth part as great as in a common steam-engine of the same effective power.

PEGGING BOOTS BY WATER.—A young mechanic of Woburn, Mass., has invented a machine to peg boots by water. The machine is a very neat piece of work, and is said by good judges to be a superior invention. A building is now erecting in Woburn, to be fitted up as a shoe factory, by Mr. S. S. Richardson, where the leather for boots and shoes is to be rolled, instead of the old way of hammering, and where the above-mentioned machine is to be put into operation.